

SEQUENCE LISTING

<110> Rosen, Craig A.
Haseltine, William A.

<120> Albumin Fusion Proteins

<130> PF548

<140> Unassigned

<141> 2001-04-12

<150> 60/229,358

<151> 2000-04-12

<150> 60/256,931

<151> 2000-12-21

<150> 60/199,384

<151> 2000-04-25

<160> 72

<170> PatentIn Ver. 2.1

<210> 1

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<221> primer_bind

<223> primer useful to clone human growth hormone cDNA

<400> 1

cccaagaatt cccttatcca ggc

23

<210> 2

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<221> primer_bind

<223> primer useful to clone human growth hormone cDNA

<400> 2

gggaagctta gaagccacag gatccctcca cag

33

<210> 3

<211> 16

<212> DNA

<213> Artificial Sequence

<220>

<221> misc_structure

<223> synthetic oligonucleotide used to join DNA fragments
with non-cohesive ends.

<400> 3
gataaagatt cccaac 16

<210> 4
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_structure
<223> synthetic oligonucleotide used to join DNA fragments
with non-cohesive ends.

<400> 4
aattgttggg aatcttt 17

<210> 5
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_structure
<223> synthetic oligonucleotide used to join DNA fragments
with non-cohesive ends.

<400> 5
ttaggcttat tccaac 17

<210> 6
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_structure
<223> synthetic oligonucleotide used to join DNA fragments
with non-cohesive ends.

<400> 6
aattgttggg aataagcc 18

<210> 7
<211> 24
<212> PRT
<213> Artificial Sequence

<220>
<221> SITE
<222> 1)..(19)
<223> invertase leader sequence

<220>
<221> SITE
<222> 20)..(24)

<223> first 5 amino acids of mature human serum albumin

<400> 7

Met Leu Leu Gln Ala Phe Leu Phe Leu Leu Ala Gly Phe Ala Ala Lys
1 5 10 15

Ile Ser Ala Asp Ala His Lys Ser
20

<210> 8

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<221> misc_structure

<223> synthetic oligonucleotide used to join DNA
fragments with non-cohesive ends.

<400> 8

gagatgcaca cctgagtgag g

21

<210> 9

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<221> misc_structure

<223> synthetic oligonucleotide used to join DNA
fragments with non-cohesive ends.

<400> 9

gatcctgtgg cttcgatgca cacaaga

27

<210> 10

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<221> misc_structure

<223> synthetic oligonucleotide used to join DNA
fragments with non-cohesive ends.

<400> 10

ctcttggtgtg catcgaagcc acag

24

<210> 11

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<221> misc_structure

<223> synthetic oligonucleotide used to join DNA

fragments with non-cohesive ends.

<400> 11
tgtggaagag cctcagaatt tattcccaac 30

<210> 12
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_structure
<223> synthetic oligonucleotide used to join DNA
fragments with non-cohesive ends.

<400> 12
aattgttggg aataaattct gaggtcttct c 31

<210> 13
<211> 47
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_structure
<223> synthetic oligonucleotide used to join DNA
fragments with non-cohesive ends.

<400> 13
ttaggcttag gtggcggtgg atccggcggt ggtggatctt tcccaac 47

<210> 14
<211> 48
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_structure
<223> synthetic oligonucleotide used to join DNA
fragments with non-cohesive ends.

<400> 14
aattgttggg aaagatccac caccgccgga tccaccgcca cctaagcc 48

<210> 15
<211> 62
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_structure
<223> synthetic oligonucleotide used to join DNA
fragments with non-cohesive ends.

<400> 15
ttaggcttag gcggtggtgg atctggtggc ggcggatctg gtggcggtgg atccttccca 60

<210> 16
 <211> 63
 <212> DNA
 <213> Artificial Sequence

<220>
 <221> misc_structure
 <223> synthetic oligonucleotide used to join DNA
 fragments with non-cohesive ends.

<400> 16
 aattgttggg aaggatccac cgccaccaga tccgccgcca ccagatccac caccgcctaa 60
 gcc 63

<210> 17
 <211> 1782
 <212> DNA
 <213> Homo sapiens

<220>
 <221> CDS
 <222> (1)..(1755)

<400> 17
 gat gca cac aag agt gag gtt gct cat cgg ttt aaa gat ttg gga gaa 48
 Asp Ala His Lys Ser Glu Val Ala His Arg Phe Lys Asp Leu Gly Glu
 1 5 10 15
 gaa aat ttc aaa gcc ttg gtg ttg att gcc ttt gct cag tat ctt cag 96
 Glu Asn Phe Lys Ala Leu Val Leu Ile Ala Phe Ala Gln Tyr Leu Gln
 20 25 30
 cag tgt cca ttt gaa gat cat gta aaa tta gtg aat gaa gta act gaa 144
 Gln Cys Pro Phe Glu Asp His Val Lys Leu Val Asn Glu Val Thr Glu
 35 40 45
 ttt gca aaa aca tgt gtt gct gat gag tca gct gaa aat tgt gac aaa 192
 Phe Ala Lys Thr Cys Val Ala Asp Glu Ser Ala Glu Asn Cys Asp Lys
 50 55 60
 tca ctt cat acc ctt ttt gga gac aaa tta tgc aca gtt gca act ctt 240
 Ser Leu His Thr Leu Phe Gly Asp Lys Leu Cys Thr Val Ala Thr Leu
 65 70 75 80
 cgt gaa acc tat ggt gaa atg gct gac tgc tgt gca aaa caa gaa cct 288
 Arg Glu Thr Tyr Gly Glu Met Ala Asp Cys Cys Ala Lys Gln Glu Pro
 85 90 95
 gag aga aat gaa tgc ttc ttg caa cac aaa gat gac aac cca aac ctc 336
 Glu Arg Asn Glu Cys Phe Leu Gln His Lys Asp Asp Asn Pro Asn Leu
 100 105 110
 ccc cga ttg gtg aga cca gag gtt gat gtg atg tgc act gct ttt cat 384
 Pro Arg Leu Val Arg Pro Glu Val Asp Val Met Cys Thr Ala Phe His
 115 120 125

tgc tat gcc aaa gtg ttc gat gaa ttt aaa cct ctt gtg gaa gag cct	1152
Cys Tyr Ala Lys Val Phe Asp Glu Phe Lys Pro Leu Val Glu Glu Pro	
370 375 380	
cag aat tta atc aaa caa aac tgt gag ctt ttt gag cag ctt gga gag	1200
Gln Asn Leu Ile Lys Gln Asn Cys Glu Leu Phe Glu Gln Leu Gly Glu	
385 390 395 400	
tac aaa ttc cag aat gcg cta tta gtt cgt tac acc aag aaa gta ccc	1248
Tyr Lys Phe Gln Asn Ala Leu Leu Val Arg Tyr Thr Lys Lys Val Pro	
405 410 415	
caa gtg tca act cca act ctt gta gag gtc tca aga aac cta gga aaa	1296
Gln Val Ser Thr Pro Thr Leu Val Glu Val Ser Arg Asn Leu Gly Lys	
420 425 430	
gtg ggc agc aaa tgt tgt aaa cat cct gaa gca aaa aga atg ccc tgt	1344
Val Gly Ser Lys Cys Cys Lys His Pro Glu Ala Lys Arg Met Pro Cys	
435 440 445	
gca gaa gac tat cta tcc gtg gtc ctg aac cag tta tgt gtg ttg cat	1392
Ala Glu Asp Tyr Leu Ser Val Val Leu Asn Gln Leu Cys Val Leu His	
450 455 460	
gag aaa acg cca gta agt gac aga gtc aca aaa tgc tgc aca gag tcc	1440
Glu Lys Thr Pro Val Ser Asp Arg Val Thr Lys Cys Cys Thr Glu Ser	
465 470 475 480	
ttg gtg aac agg cga cca tgc ttt tca gct ctg gaa gtc gat gaa aca	1488
Leu Val Asn Arg Arg Pro Cys Phe Ser Ala Leu Glu Val Asp Glu Thr	
485 490 495	
tac gtt ccc aaa gag ttt aat gct gaa aca ttc acc ttc cat gca gat	1536
Tyr Val Pro Lys Glu Phe Asn Ala Glu Thr Phe Thr Phe His Ala Asp	
500 505 510	
ata tgc aca ctt tct gag aag gag aga caa atc aag aaa caa act gca	1584
Ile Cys Thr Leu Ser Glu Lys Glu Arg Gln Ile Lys Lys Gln Thr Ala	
515 520 525	
ctt gtt gag ctt gtg aaa cac aag ccc aag gca aca aaa gag caa ctg	1632
Leu Val Glu Leu Val Lys His Lys Pro Lys Ala Thr Lys Glu Gln Leu	
530 535 540	
aaa gct gtt atg gat gat ttc gca gct ttt gta gag aag tgc tgc aag	1680
Lys Ala Val Met Asp Asp Phe Ala Ala Phe Val Glu Lys Cys Cys Lys	
545 550 555 560	
gct gac gat aag gag acc tgc ttt gcc gag gag ggt aaa aaa ctt gtt	1728
Ala Asp Asp Lys Glu Thr Cys Phe Ala Glu Glu Gly Lys Lys Leu Val	
565 570 575	
gct gca agt caa gct gcc tta ggc tta taacatctac atttaaaagc atctcag	1782
Ala Ala Ser Gln Ala Ala Leu Gly Leu	
580 585	

<210> 18
<211> 585

<212> PRT

<213> Homo Sapiens

<400> 18

Asp Ala His Lys Ser Glu Val Ala His Arg Phe Lys Asp Leu Gly Glu
1 5 10 15
Glu Asn Phe Lys Ala Leu Val Leu Ile Ala Phe Ala Gln Tyr Leu Gln
20 25 30
Gln Cys Pro Phe Glu Asp His Val Lys Leu Val Asn Glu Val Thr Glu
35 40 45
Phe Ala Lys Thr Cys Val Ala Asp Glu Ser Ala Glu Asn Cys Asp Lys
50 55 60
Ser Leu His Thr Leu Phe Gly Asp Lys Leu Cys Thr Val Ala Thr Leu
65 70 75 80
Arg Glu Thr Tyr Gly Glu Met Ala Asp Cys Cys Ala Lys Gln Glu Pro
85 90 95
Glu Arg Asn Glu Cys Phe Leu Gln His Lys Asp Asp Asn Pro Asn Leu
100 105 110
Pro Arg Leu Val Arg Pro Glu Val Asp Val Met Cys Thr Ala Phe His
115 120 125
Asp Asn Glu Glu Thr Phe Leu Lys Lys Tyr Leu Tyr Glu Ile Ala Arg
130 135 140
Arg His Pro Tyr Phe Tyr Ala Pro Glu Leu Leu Phe Phe Ala Lys Arg
145 150 155 160
Tyr Lys Ala Ala Phe Thr Glu Cys Cys Gln Ala Ala Asp Lys Ala Ala
165 170 175
Cys Leu Leu Pro Lys Leu Asp Glu Leu Arg Asp Glu Gly Lys Ala Ser
180 185 190
Ser Ala Lys Gln Arg Leu Lys Cys Ala Ser Leu Gln Lys Phe Gly Glu
195 200 205
Arg Ala Phe Lys Ala Trp Ala Val Ala Arg Leu Ser Gln Arg Phe Pro
210 215 220
Lys Ala Glu Phe Ala Glu Val Ser Lys Leu Val Thr Asp Leu Thr Lys
225 230 235 240
Val His Thr Glu Cys Cys His Gly Asp Leu Leu Glu Cys Ala Asp Asp
245 250 255
Arg Ala Asp Leu Ala Lys Tyr Ile Cys Glu Asn Gln Asp Ser Ile Ser
260 265 270
Ser Lys Leu Lys Glu Cys Cys Glu Lys Pro Leu Leu Glu Lys Ser His
275 280 285
Cys Ile Ala Glu Val Glu Asn Asp Glu Met Pro Ala Asp Leu Pro Ser
290 295 300

Leu Ala Ala Asp Phe Val Glu Ser Lys Asp Val Cys Lys Asn Tyr Ala
 305 310 315 320
 Glu Ala Lys Asp Val Phe Leu Gly Met Phe Leu Tyr Glu Tyr Ala Arg
 325 330 335
 Arg His Pro Asp Tyr Ser Val Val Leu Leu Leu Arg Leu Ala Lys Thr
 340 345 350
 Tyr Glu Thr Thr Leu Glu Lys Cys Cys Ala Ala Ala Asp Pro His Glu
 355 360 365
 Cys Tyr Ala Lys Val Phe Asp Glu Phe Lys Pro Leu Val Glu Glu Pro
 370 375 380
 Gln Asn Leu Ile Lys Gln Asn Cys Glu Leu Phe Glu Gln Leu Gly Glu
 385 390 395 400
 Tyr Lys Phe Gln Asn Ala Leu Leu Val Arg Tyr Thr Lys Lys Val Pro
 405 410 415
 Gln Val Ser Thr Pro Thr Leu Val Glu Val Ser Arg Asn Leu Gly Lys
 420 425 430
 Val Gly Ser Lys Cys Cys Lys His Pro Glu Ala Lys Arg Met Pro Cys
 435 440 445
 Ala Glu Asp Tyr Leu Ser Val Val Leu Asn Gln Leu Cys Val Leu His
 450 455 460
 Glu Lys Thr Pro Val Ser Asp Arg Val Thr Lys Cys Cys Thr Glu Ser
 465 470 475 480
 Leu Val Asn Arg Arg Pro Cys Phe Ser Ala Leu Glu Val Asp Glu Thr
 485 490 495
 Tyr Val Pro Lys Glu Phe Asn Ala Glu Thr Phe Thr Phe His Ala Asp
 500 505 510
 Ile Cys Thr Leu Ser Glu Lys Glu Arg Gln Ile Lys Lys Gln Thr Ala
 515 520 525
 Leu Val Glu Leu Val Lys His Lys Pro Lys Ala Thr Lys Glu Gln Leu
 530 535 540
 Lys Ala Val Met Asp Asp Phe Ala Ala Phe Val Glu Lys Cys Cys Lys
 545 550 555 560
 Ala Asp Asp Lys Glu Thr Cys Phe Ala Glu Glu Gly Lys Lys Leu Val
 565 570 575
 Ala Ala Ser Gln Ala Ala Leu Gly Leu
 580 585

<210> 19
 <211> 57
 <212> DNA

<213> Artificial Sequence

<220>

<221> primer_bind

<223> primer used to generate XhoI and ClaI
site in pPPC0006

<400> 19

gcctcgagaa aagagatgca cacaagagtg aggttgctca tcgatttaaa gatttgg 57

<210> 20

<211> 58

<212> DNA

<213> Artificial Sequence

<220>

<221> primer_bind

<223> primer used in generation XhoI and ClaI
site in pPPC0006

<400> 20

aatcgatgag caacctcact cttgtgtgca tctcttttct cgaggctcct ggaataag 58

<210> 21

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<221> primer_bind

<223> primer used in generation XhoI and ClaI
site in pPPC0006

<400> 21

tacaaactta agagtccaat tagc 24

<210> 22

<211> 29

<212> DNA

<213> Artificial Sequence

<220>

<221> primer_bind

<223> primer used in generation XhoI and ClaI
site in pPPC0006

<400> 22

cacttctcta gagtgtttc atatgtctt 29

<210> 23

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<221> Misc_Structure

<223> Synthetic oligonucleotide used to alter restriction sites in pPPC0007

<400> 23

aagctgcctt aggcttataa taaggcgcgc cgcccgccg tttaaactaa gcttaattct 60

<210> 24

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<221> Misc_Structure

<223> Synthetic oligonucleotide used to alter restriction sites in pPPC0007

<400> 24

agaattaagc ttagtttaaa cgcccgccg gcgcgcctta ttataagcct aaggcagctt 60

<210> 25

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<221> primer_bind

<223> forward primer useful for generation of albumin fusion protein in which the albumin moiety is N-terminal of the Therapeutic Protein

<220>

<221> misc feature

<222> (18)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (19)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (20)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (21)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (22)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (23)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (24)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (25)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (26)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (27)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (28)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (29)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (30)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (31)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (32)

<223> n equals a,t,g, or c

<400> 25

aagctgcctt aggcttannn nnnnnnnnnn nn

32

<210> 26

<211> 51

<212> DNA

<213> Artificial Sequence

<220>

<221> primer_bind

<223> reverse primer useful for generation of albumin fusion protein in which the albumin moiety is N-terminal of the Therapeutic Protein

<220>
<221> misc feature
<222> (37)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (38)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (39)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (40)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (41)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (42)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (43)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (44)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (45)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (46)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (47)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (48)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (49)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (50)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (51)
<223> n equals a,t,g, or c

<400> 26
gcgcgcgttt aaacggccgg ccggcgcgcc ttattannnn nnnnnnnnnn n

51

<210> 27
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> forward primer useful for generation of albumin fusion protein in which the albumin moiety is c-terminal of the Therapeutic Protein

<220>
<221> misc feature
<222> (19)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (20)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (21)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (22)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (23)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (24)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (25)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (26)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (27)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (28)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (29)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (30)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (31)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (32)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (33)
<223> n equals a,t,g, or c

<400> 27
aggagcgtcg acaaaagann nnnnnnnnnn nnn

33

<210> 28
<211> 52
<212> DNA
<213> Artificial Sequence

<220>
<221> primer_bind
<223> reverse primer useful for generation of albumin
fusion protein in which the albumin moiety is c-terminal of
the Therapeutic Protein

<220>
<221> misc feature
<222> (38)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (39)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (40)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (41)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (42)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (43)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (44)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (45)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (46)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (47)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (48)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (49)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (50)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (51)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (52)
<223> n equals a,t,g, or c

<400> 28
ctttaaatcg atgagcaacc tcactcttgt gtgcacnnnn nnnnnnnnnn nn

52

<210> 29
<211> 24
<212> PRT
<213> Artificial Sequence

<220>
<221> signal
<223> signal peptide of natural human serum albumin protein

<400> 29
Met Lys Trp Val Ser Phe Ile Ser Leu Leu Phe Leu Phe Ser Ser Ala
1 5 10 15

Tyr Ser Arg Ser Leu Asp Lys Arg
20

<210> 30
<211> 114
<212> DNA
<213> Artificial Sequence

<220>
<221> primer_bind
<223> forward primer useful for generation of PC4:HSA
albumin fusion VECTOR

<220>
<221> misc_feature
<222> (5)..(10)
<223> BamHI restriction site

<220>
<221> misc_feature
<222> (11)..(16)
<223> Hind III restriction site

<220>
<221> misc_feature
<222> (17)..(27)
<223> Kozak sequence

<220>
 <221> misc_feature
 <222> (25)..(97)
 <223> cds natural signal sequence of human serum albumin

 <220>
 <221> misc_feature
 <222> (75)..(81)
 <223> XhoI restriction site

 <220>
 <221> misc_feature
 <222> (98)..(114)
 <223> cds first six amino acids of human serum albumin

 <400> 30
 tcaggggatcc aagcttccgc caccatgaag tgggtaacct ttatttcctc tctttttctc 60
 tttagctcgg cttactcgag ggggtgtgtt cgctcgagatg cacacaagag tgag 114

 <210> 31
 <211> 43
 <212> DNA
 <213> Artificial Sequence

 <220>
 <221> primer_bind
 <223> reverse primer useful for generation of
 PC4:HSA albumin fusion VECTOR

 <220>
 <221> misc_feature
 <222> (6)..(11)
 <223> Asp718 restriction site

 <220>
 <221> misc_feature
 <222> (12)..(17)
 <223> EcoRI restriction site

 <220>
 <221> misc_feature
 <222> (15)..(17)
 <223> reverse complement of stop codon

 <220>
 <221> misc_feature
 <222> (18)..(25)
 <223> AscI restriction site

 <220>
 <221> misc_feature
 <222> (18)..(43)
 <223> reverse complement of DNA sequence encoding last 9 amino acids

 <400> 31
 gcagcgggtac cgaattcggc ggcgcttata agcctaaggc agc 43

 <210> 32

<211> 46
 <212> DNA
 <213> Artificial Sequence

 <220>
 <221> primer_bind
 <223> forward primer useful for inserting Therapeutic
 protein into pC4:HSA vector

 <220>
 <221> misc feature
 <222> (29)
 <223> n equals a,t,g, or c

 <220>
 <221> misc feature
 <222> (30)
 <223> n equals a,t,g, or c

 <220>
 <221> misc feature
 <222> (31)
 <223> n equals a,t,g, or c

 <220>
 <221> misc feature
 <222> (32)
 <223> n equals a,t,g, or c

 <220>
 <221> misc feature
 <222> (33)
 <223> n equals a,t,g, or c

 <220>
 <221> misc feature
 <222> (34)
 <223> n equals a,t,g, or c

 <220>
 <221> misc feature
 <222> (35)
 <223> n equals a,t,g, or c

 <220>
 <221> misc feature
 <222> (36)
 <223> n equals a,t,g, or c

 <220>
 <221> misc feature
 <222> (37)
 <223> n equals a,t,g, or c

 <220>
 <221> misc feature
 <222> (38)
 <223> n equals a,t,g, or c

 <220>

<221> misc feature
<222> (39)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (40)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (41)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (42)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (43)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (44)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (45)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (46)
<223> n equals a,t,g, or c

<400> 32
ccgccgctcg aggggtgtgtg ttctgcgann nnnnnnnnnnn nnnnnnn

46

<210> 33
<211> 55
<212> DNA
<213> Artificial Sequence

<220>
<221> primer_bind
<223> reverse primer useful for inserting Therapeutic
protein into pC4:HSA vector

<220>
<221> misc feature
<222> (38)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (39)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (40)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (41)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (42)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (43)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (44)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (45)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (46)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (47)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (48)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (49)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (50)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (51)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (52)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (53)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (54)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (55)

<223> n equals a,t,g, or c

<400> 33

agtcccatcg atgagcaacc tcactcttgt gtgcatcnnn nnnnnnnnnn nnnnn

55

<210> 34

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<221> signal

<223> Stanniocalcin signal peptide

<400> 34

Met Leu Gln Asn Ser Ala Val Leu Leu Leu Val Ile Ser Ala Ser

1

5

10

15

Ala

<210> 35

<211> 22

<212> PRT

<213> Artificial Sequence

<220>

<221> signal

<223> Synthetic signal peptide

<400> 35

Met Pro Thr Trp Ala Trp Trp Leu Phe Leu Val Leu Leu Leu Ala Leu

1

5

10

15

Trp Ala Pro Ala Arg Gly

20

<210> 36

<211> 23

<212> DNA

<213> Artificial Sequence

<220>
<221>primer_bind
<223>Degenerate VH forward primer useful for
amplifying human VH domains

<400> 36
caggtgcagc tgggtgcagtc tgg 23

<210> 37
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<221>primer_bind
<223>Degenerate VH forward primer useful for
amplifying human VH domains

<400> 37
caggtcaact taaggagtc tgg 23

<210> 38
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<221>primer_bind
<223>Degenerate VH forward primer useful for
amplifying human VH domains

<400> 38
gaggtgcagc tgggtggagtc tgg 23

<210> 39
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<221>primer_bind
<223>Degenerate VH forward primer useful for
amplifying human VH domains

<400> 39
caggtgcagc tgcaggagtc ggg 23

<210> 40
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<221>primer_bind
<223>Degenerate VH forward primer useful for
amplifying human VH domains

<400> 40
gaggtgcagc tgttgca gtc 23

<210> 41
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<221>primer_bind
<223>Degenerate VH forward primer useful for
amplifying human VH domains

<400> 41
caggtacagc tgcagcagtc agg 23

<210> 42
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<221>primer_bind
<223>Degenerate JH reverse primer useful for
amplifying human VH domains

<400> 42
tgaggagacg gtgaccaggg tgcc 24

<210> 43
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<221>primer_bind
<223>Degenerate JH reverse primer useful for
amplifying human VH domains

<400> 43
tgaagagacg gtgaccattg tccc 24

<210> 44
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<221>primer_bind
<223>Degenerate JH reverse primer useful for
amplifying human VH domains

<400> 44
tgaggagacg gtgaccaggg ttcc 24

<210> 45
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
 <221>primer_bind
 <223>Degenerate JH reverse primer useful for
 amplifying human VH domains

<400> 45
 tgaggagacg gtgaccgtgg tccc 24

<210> 46
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <221>primer_bind
 <223>Degenerate Vkappa forward primer useful for
 amplifying human VL domains

<400> 46
 gacatccaga tgaccagtc tcc 23

<210> 47
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <221>primer_bind
 <223>Degenerate Vkappa forward primer useful for
 amplifying human VL domains

<400> 47
 gatgttgatga tgactcagtc tcc 23

<210> 48
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <221>primer_bind
 <223>Degenerate Vkappa forward primer useful for
 amplifying human VL domains

<400> 48
 gatattgtga tgactcagtc tcc 23

<210> 49
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <221>primer_bind
 <223>Degenerate Vkappa forward primer useful for
 amplifying human VL domains

<400> 49
 gaaattgtgt tgacgcagtc tcc 23

<210> 50
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<221>primer_bind
<223>Degenerate Vkappa forward primer useful for
amplifying human VL domains

<400> 50
gacatcgtga tgacccagtc tcc 23

<210> 51
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<221>primer_bind
<223>Degenerate Vkappa forward primer useful for
amplifying human VL domains

<400> 51
gaaacgacac tcacgcagtc tcc 23

<210> 52
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<221>primer_bind
<223>Degenerate Vkappa forward primer useful for
amplifying human VL domains

<400> 52
gaaattgtgc tgactcagtc tcc 23

<210> 53
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<221>primer_bind
<223>Degenerate Vlambda forward primer useful for
amplifying human VL domains

<400> 53
cagtctgtgt tgacgcagcc gcc 23

<210> 54
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<221>primer_bind

<223>Degenerate Vlambda forward primer useful for
amplifying human VL domains

<400> 54

cagtctgccc tgactcagcc tgc

23

<210> 55

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<221>primer_bind

<223>Degenerate Vlambda forward primer useful for
amplifying human VL domains

<400> 55

tcctatgtgc tgactcagcc acc

23

<210> 56

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<221>primer_bind

<223>Degenerate Vlambda forward primer useful for
amplifying human VL domains

<400> 56

tcttctgagc tgactcagga ccc

23

<210> 57

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<221>primer_bind

<223>Degenerate Vlambda forward primer useful for
amplifying human VL domains

<400> 57

cacgttatac tgactcaacc gcc

23

<210> 58

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<221>primer_bind

<223>Degenerate Vlambda forward primer useful for
amplifying human VL domains

<400> 58

caggctgtgc tcactcagcc gtc

23

<210> 59

<211> 23

<212> DNA
<213> Artificial Sequence

<220>
<221>primer_bind
<223>Degenerate Vlambda forward primer useful for
amplifying human VL domains

<400> 59
aattttatgc tgactcagcc cca

23

<210> 60
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<221>primer_bind
<223>Degenerate Jkappa reverse primer useful for
amplifying human VL domains

<400> 60
acgtttgatt tccaccttgg tccc

24

<210> 61
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<221>primer_bind
<223>Degenerate Jkappa reverse primer useful for
amplifying human VL domains

<400> 61
acgtttgatc tccagcttgg tccc

24

<210> 62
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<221>primer_bind
<223>Degenerate Jkappa reverse primer useful for
amplifying human VL domains

<400> 62
acgtttgata tccactttgg tccc

24

<210> 63
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<221>primer_bind
<223>Degenerate Jkappa reverse primer useful for
amplifying human VL domains

<400> 63
acgtttgatc tccaccttgg tccc 24

<210> 64
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<221>primer_bind
<223>Degenerate Jkappa reverse primer useful for
amplifying human VL domains

<400> 64
acgtttaatc tccagtcgtg tccc 24

<210> 65
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<221>primer_bind
<223>Degenerate Jlambda reverse primer useful for
amplifying human VL domains

<400> 65
cagtctgtgt tgacgcagcc gcc 23

<210> 66
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<221>primer_bind
<223>Degenerate Jlambda reverse primer useful for
amplifying human VL domains

<400> 66
cagtctgccc tgactcagcc tgc 23

<210> 67
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<221>primer_bind
<223>Degenerate Jlambda reverse primer useful for
amplifying human VL domains

<400> 67
tcctatgtgc tgactcagcc acc 23

<210> 68
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
 <221>primer_bind
 <223>Degenerate Jlambda reverse primer useful for
 amplifying human VL domains

<400> 68
 tcttctgagc tgactcagga ccc

23

<210> 69
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <221>primer_bind
 <223>Degenerate Jlambda reverse primer useful for
 amplifying human VL domains

<400> 69
 cacgttatac tgactcaacc gcc

23

<210> 70
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <221>primer_bind
 <223>Degenerate Jlambda reverse primer useful for
 amplifying human VL domains

<400> 70
 caggctgtgc tcactcagcc gtc

23

<210> 71
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <221>primer_bind
 <223>Degenerate Jlambda reverse primer useful for
 amplifying human VL domains

<400> 71
 aattttatgc tgactcagcc cca

23

<210> 72
 <211> 15
 <212> PRT
 <213> Artificial Sequence

<220>
 <221>turn
 <223>Linker peptide that may be used to join VH
 and VL domains in an scFv.

<400> 72
 Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
 1 5 10 15